CLAIMS

Please amend the claims as follows:

1. (Currently amended) A method of screening a compound library or portion thereof by absorption, said method comprising:

providing a primary compound library or portion thereof having a plurality of test samples containing isolated compounds or isolated mixtures of compounds per test sample;

generating *in vitro* bioavailability data from each of said test samples, the bioavailability data comprising permeability and solubility data;

generating an *in vivo* absorption profile for each of said test samples from initial dose data and from the generated *in vitro* bioavailability data, wherein said *in vivo* absorption profile is characterized by one or more of rate of absorption, extent of absorption, and concentration of a test sample relative to a selected site of administration and a selected sampling site for one or more physiological barriers to absorption of a mammalian system of interest;

selecting a desired *in vivo* absorption profile~~;~~

~~screening said test samples from said primary compound library for *in vivo* absorption profiles that are above or equivalent to the desired *in vivo* absorption profile~~, and

based on the generated *in vivo* absorption profiles, generating a secondary compound library comprising test samples having the desired absorption profile. ~~from said screening of said test samples.~~

2. (Currently amended) The method of claim 1, wherein said generating an *in vivo* absorption profile comprises:

providing said initial dose data and said *in vitro* bioavailability data to a computer-implemented pharmacokinetic took (PK tool), wherein said PK tool comprises as computer-readable components, an input/output system, a simulation engine, and a simulation model comprising a physiological model of said mammalian system of interest, wherein said input/output system, simulation engine and simulation model are capable of working together to carry out the steps of:

(i) receiving through the input/output system as input data, said initial dose data and said *in vitro* bioavailability data for one of said test samples; and

(ii) generating as output data a simulated *in ~~vitro~~ vivo* absorption profile for said test sample.

3. (Currently amended) The method of claim 1, which further comprises:

screening said test samples by one or more properties in addition to absorption, the one or more properties in addition to absorption being selected from the group consisting of metabolism, toxicity and activity;

selecting compounds by one or more of said properties, and

producing one or more compound libraries characterized by absorption, and one or more of said properties.

4. (Cancelled) The method of claim 3, wherein said one or more properties in addition to absorption is selected from the group consisting of metabolism, toxicity and activity.

5. (Currently Amended) A method of screening a compound library or portion thereof by absorption, said method comprising:

providing a primary compound library or portion thereof having a plurality of test samples containing isolated compounds or isolated mixtures of compounds per test sample;

generating *in vitro* bioavailability data from each of said test samples, the bioavailability data comprising permeability and solubility data;

generating a simulated *in* vivo absorption profile for each of said test samples from initial dose data and from *in vitro* bioavailability data, wherein said absorption profile is characterized by one or more of rate of absorption, extent of absorption, and concentration of a test sample relative to a selected site of administration and a selected sampling site for one or more physiological barriers to absorption or a mammalian system of interest, wherein said simulated *in vivo* absorption profile is generated by: providing said initial dose data and said *in vitro* bioavailability data to a computer-implemented pharmacokinetic tool (PK tool) which comprises a~~-~~s computer-readable components, an input/output system, a simulation engine, and a simulation model comprising a physiological model of said mammalian system of interest, wherein said input/output system, simulation engine and simulation model are capable of working together to carry out the steps of:

(i) receiving through the input/output system as input data, said initial dose data and said *in vitro* bioavailability data for one or said test samples; and

(ii) generating as output data a simulated *in vivo* absorption for said test samples;

selecting a desired simulated *in* vivo absorption profile~~,~~;

~~screening said test samples from said primary compound library for simulated *in vivo* absorption profiles that are above or equivalent to the desired simulated *in vivo* absorption profile;~~ and

based on the generated *in vivo* absorption profiles, generating a secondary library comprising test samples having the desired absorption profile ~~from said screening of said test samples~~.

6. (Currently amended) The method of claim 5, wherein said physiological model is a mathematical model of said mammalian system comprising as operably linked components: (i) differential equations for calculating solubility and absorption of a test sample for one or more physiological segments of the mammal system of interest; and (ii) initial parameter values for the differential equations corresponding to physiological parameters and one or mores selectively optimized adjustment parameters, and optionally one or more regional correlation parameters, for one or more physiological segments of said mammal system of interest; and optionally (iii) control statement rules for one or more of absorption, permeability, solubility, dissolution, concentration, and mathematical error correction, for one or more physiological segments of said mammal system of interest.

7. (Previously amended) The method of claim 1 or 6, wherein permeability rate data and transport mechanism data are derived from a cell-based assay.

8. (Previously amended) The method of claim 1 or 6, wherein solubility rate data and dissolution rate data are derived from a chemical-based assay.

9. (Previously amended) The method of claim 6, wherein one or more permeability data is derived from structure activity relationship information of one or more compounds of said primary compound library.

10. (Previously amended) The method of claim 6, wherein solubility data is derived from structure activity relationship information of one or more compounds of said primary compound library.

11. (Previously amended) The method of claim 6, wherein dissolution rate data is derived from structure activity relationship information of one or more compounds of said primary compound library.

12. (Original) The method of claim 1 or 6, wherein said mammalian system of interest is selected from the group consisting of the gastrointestinal tract, the eye, the nose, the lung, the skin, and the brain.

13. (Previously amended) The method of claim 1 or 6, wherein said primary compound library is selected from the group consisting of a natural library, a synthetic library, and a combinatorial library.

14. (Previously amended) The method of claim 13, wherein said primary compound library comprises compounds of unknown biological activity.

15. (Original) the method of claim 2 or 6, wherein said physiological model is for a mammalian system selected from the group consisting of gastrointestinal tract, eye, nose, lung, skin, and blood brain barrier.

16. (Previously amended) The method of claim 6, which further comprises:

screening said test samples by one or more properties in addition to absorption;

selecting compounds by one or more of said properties, and

producing one or more compound libraries characterized by absorption, and one or more of said properties.

17. (Original) The method of claim 16, wherein said one or more properties in addition to absorption is selected from the group consisting of metabolism, toxicity and activity.

18. (Withdrawn) A secondary compound library produced by the method of claim 1, 3, 6 or 16.